

**Amendments to the Specification:**

Please amend the title, as it appears on the International Publication Page, to read as follows:

**DISPLAY ELEMENT AND DISPLAY DEVICE USING THE SAME**

Please amend the paragraph beginning on page 3, line 21 to read as follows:

A display ~~device element~~ according to the present invention extracts, from a lateral face of a waveguide, light that is propagated in the waveguide by changing the shape of the waveguide lateral face, and therefore is capable of extracting propagated light with high efficiency. This makes possible a display that is bright and uniform.

Please amend the paragraph beginning on page 10, line 31 to read as follows:

The thickness of the waveguide 3 is determined according to the number of pixels and the size of the display area. In the display element 1, the length L of the portions of the waveguide 3 that are made to change form by the actuators 4 corresponds to the length of one pixel in the horizontal direction (propagation direction of light in the waveguide 3). For example, the display size of a display device 100 using the display element 1 described below is that of a HDTV in the range of 60 to 100 inches. In this case for example, the size of a single pixel is approximately in the range of 230.6  $\mu\text{m}$  (vertical)  $\times$  691.8  $\mu\text{m}$  (horizontal) to 384.3  $\mu\text{m}$  (vertical)  $\times$  1,153  $\mu\text{m}$  (horizontal). It should be noted that here vertical is the length in the perpendicular direction with respect to the propagation direction of length in the waveguide 3 and horizontal is the length in the propagation direction of light in the waveguide 3. The thickness D of the waveguide 3 here is preferably not ~~greater less~~ than 345.9  $\mu\text{m}$  and not greater than 576.5  $\mu\text{m}$ . The thickness D of the waveguide 3 is preferably not greater than 1/2 of the length L (the length of the actuators 4 in the propagation direction of light in the waveguide 3) of the portions of the waveguide 3 that are made to change form by the actuators 4.

Please amend the paragraph beginning on page 14, line 26 to read as follows:

When no voltage is applied between the electrode film 14a and the external electrode films [[14b]] 14c, only the convex portions of the concavo-convex shaped external electrode films 14c and the insulation thin film [[14d]] 14b are connected at the end portions of the display element 11 shown in FIG. 4. For this reason, the lateral face of the waveguide 3 is flat. However, by applying a voltage between the electrode film 14a and the external electrode films 14c, an electrostatic force is produced therebetween such that these are attracted to each other. Due to this, as shown in the central area of the display element 11 shown in FIG. 4, the electrode film 14a and the external electrode film 14c cling toward each other and the electrode film 14a and the external electrode film 14c are deformed to the same concavo-convex shape. Furthermore, the electrode film 14a is adhering to the waveguide 3, and therefore the cladding 3b and the surface of the core 3a are deformed to the same concavo-convex shape as the external electrode films 14c. That is, the lateral face of the waveguide 3 changes shape. It should be noted that the core 3a is particularly soft and therefore changes shape greatly. In this way, light that is being propagated while being totally reflected in the waveguide 3 can be extracted to the outside from the lateral face of the waveguide 3. As in Embodiment 1, a light 12c that is being propagated while being totally reflected in the waveguide 3 by the surfaces of the core 3a can be leaked to the outside from the lateral face of the waveguide 3 by deforming the lateral face on one side of the waveguide 3.

Please amend the paragraph beginning on page 15, line 28 to read as follows:

When sequential line scanning actually is carried out by introducing incident light to the waveguide 3 from the 3-color LED light source 2, applying +10V as a selective voltage between the electrode film 14a and the external electrode film 14c, and applying 0V to a non-selective location, a uniformly bright display is achieved from the lateral face (display surface 1a) of the waveguide 3. Even at low voltages, it is possible to extract to the outside almost all the incident light of the light source 2, thus achieving a display element 11 with high power efficiency.

Please amend the paragraph beginning on page 21, line 30 to read as follow:

Furthermore, ~~particles~~ 26 particles made of an acrylic resin containing rhodamine, which is a fluorochrome, may be used as the particles 26. In this case, the light extracted from the lateral face of the waveguide 23 when using a green LED that emits a 520 nm wavelength light as the light source 22 was observed to be an orange light with a wavelength of 580 nm. In this way, by selectively using particles 26 that contain a fluorochrome or a fluorescent substance, and an LED light source 22 that corresponds to the excitation wavelength of the fluorochrome or the fluorescent substance, it is possible to extract light of various wavelengths. Furthermore, by using an ultraviolet light LED as the light source 22 and by using the fluorescent substances used in PDPs as the particles 26, it is possible to achieve display of RGB even when using a single color LED as the light source 22.

Please amend the paragraph beginning on page 23, line 16 to read as follows:

Since 3-color LEDs are used as the light sources 22, it is possible to make light of three colors incident on a single waveguide 33. This makes it possible to display light of three colors with a single display element 21, that is, with one line. With conventional display devices such as liquid crystal displays and PDPs, a pixel is configured by three sub-pixels of the three primary colors R, G, and B. However, with the display device using the waveguide 23 of Embodiment 3, it is not necessary to divide the waveguides 23 that extend in the row direction for each color and the three primary colors can be incident on a single waveguide 23. Therefore it is possible to reduce the number of waveguides 23 (display elements 21), thus providing the effect of reduced costs.

Please amend the paragraph beginning on page 24, line 11 to read as follows:

A display element 31 was actually formed using the particles 26 made of Teflon (registered trademark) with a surface tension of 18.4 mN/m, for example. The mean particle size of the particles 26 was set at 6 µm and the filling rate of the particles 26 in the space between the waveguide electrode film 23c and the opposing electrode film 24 was set at 20%. A voltage of 50V was applied so that the waveguide electrode film 23c of the selected line became negative and the opposing electrode film 24 became positive. In this way, the particles 26 came in contact with the surface of the waveguide electrode

film 23c and the leaked light from the contact portion was extracted toward the substrate 25. On the other hand, a voltage of 50V was applied to reverse the electric field, namely so that the waveguide electrode film 23c became positive and the opposing electrode film 24 became negative. In this way, since the particles 26 move away from the surface of the waveguide electrode film 23c, the light from the light source 22 propagated in the waveguide 23 cannot be extracted as leaked light. In this case, display and non-display can be switched by a small voltage in the display element 31 of Embodiment 4. This is because the surface tension of the glycerin, which is the coating material 37 is sufficiently larger than the surface tension of the Teflon (registered trademark) of the particles 26. In this way, the so called springiness at the contact surface between the particles 26 and the coating material 37 becomes greater. Springiness is a physical phenomenon in which springing occurs without the coating material 37 spreading against surface of the particles 26. That is, the greater the springiness between the particles 26 and the coating material 37, the greater the rebound at contact between the particles 26 and the waveguide electrode film 23c. For this reason, the particles 26 can be made to move away more easily from the waveguide electrode film 23c. Accordingly, contact and non-contact between the particles 26 and the waveguide electrode film 23c can be controlled with a low voltage.

Please amend the paragraph beginning on page 27, line 8 to read as follows:

Accordingly, from the point of view of extraction efficiency, the thickness of the waveguide in the display element of embodiments 1 to 4 is preferably less than 1/2 of the pixel width and, moreover, in consideration of the angle distribution of the incident light, it is more preferably thinner still. It should be noted that, specifically, the pixel width is the length of the electrodes 4 and 14 in the longitudinal direction of the waveguide 3 in FIGS. 1 and 2 for the display elements of embodiments 1 and 2, and is the length in the longitudinal direction of the waveguide electrode film 23c or ~~waveguide 23~~ in FIGS. 5 and 6 for embodiments 3 and 4.